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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/249,100	02/12/1999	TAKUO HIBI	Q053271	9567

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EXAMINER

NGUYEN, NGOC YEN M

ART UNIT

PAPER NUMBER

1754

27

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/249,100

Applicant(s)

Hibi et al

Examiner

N. M. Nguyen

Art Unit

1754



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jul 17, 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-76, 79, 82-85, 87, and 88 is/are pending in the application.
- 4a) Of the above, claim(s) 1-75 and 88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 76, 79, 82-85, and 87 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

Art Unit: 1754

DETAILED ACTION

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 76, 79, 82-85, 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grätzel '231, optionally in view of Bankmann et al (5,387,726) or Umemura et al (4,177,161).

Grätzel '231 discloses a catalyst comprising highly dispersed Ru/RuO_x (x less than or equal 2) on TiO₂ carrier (note Example 1 and claim 1). Grätzel '231 further discloses that in the case of TiO₂, mixture of anatase and rutile forms work very well as support material, however, pure anatase and pure rutile have also yielded good results when used in conjunction with the mixed ruthenium as a catalyst (note column 3, lines 26-31). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pure rutile form as the support for the catalyst of Grätzel '231 because the rutile form have yielded good results.

For the product-by-process limitations, any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the

Art Unit: 1754

applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see *In re Brown*, 173 U.S.P.Q 685, and *In re Fessmann*, 180 U.S.P.Q. 324.

Grätzel '231 does not specifically disclose the amount of "OH" in the titanium dioxide carrier, however, the instant claims are drawn to a final product, not the raw material, i.e. the titanium dioxide carrier or the process of making the catalyst. This limitation can be considered as a product-by-process limitation, see *In re Fessmann*, *In re Brown* as stated above. There is no difference seen between the product of Grätzel '231 and the claimed product. It appears that the OH groups are inherently present on the titanium oxide (note instant application, page 46, lines 12-14), and in the event that the concentration of the "OH" group in the titanium oxide carrier used in Grätzel '231 is not the same as the required range, Grätzel '231 does disclose that the catalyst product is calcined at 375°C for 12-18 hours, which condition is similar to that disclosed in the instant application to adjust the OH concentration (note page 50, first full paragraph or page 123, lines 7-13, which stated that the OH group in the titanium carrier is eliminated by heating, and the content of the OH group can be controlled by changing the calcination temperature and calcination time), such calcination condition would render the titanium dioxide carrier in the catalyst product to have the similar concentration of OH group as required in the instant claims. [Even if the amount of OH groups in the carrier of Gratzel before forming the catalyst may be different than that required in the instant claims, however, the instant claims are drawn to the catalyst final product, not to the carrier intermediate product. There is no evidence

Art Unit: 1754

on record to show that after the step of forming the catalyst, the claimed catalyst still maintains the same amount of OH groups.]

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to optimize the process condition in Grätzel '231 and in turn the amount of "OH" in the catalyst to obtain the best results, i.e. a catalyst suitable for hydrogenation processes.

Optionally, in the event that the instant claims require that the titanium dioxide carrier before it is used to make the catalyst has the claimed amount of OH group, Bankmann '726 or Umemura '161 can be applied to teach that it is conventional in the art to obtain rutile titanium oxide by calcining at 700°C for 5 hours (note Bankmann '726, lines 18-22) or 670-900°C for 30 minutes to 2 hours (note Umemura '161, lines 8-34).

Since Grätzel '231 teaches that the titanium oxide used should be in rutile form, it would have been obvious to one of ordinary skill in the art to calcine the titanium oxide to the temperature and for the amount of time as suggested by either Bankmann or Umemura to convert the titanium oxide to rutile form. These calcination condition would naturally adjust the amount of OH group on the titanium oxide to the claimed range.

Claims 76, 79, 82-85, 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buysch et al (6,001,768), optionally in view either of Bankmann or Umemura.

Buysch '768 discloses a supported catalyst containing, a platinum, a platinum metal compound or a complex containing a platinum metal compound on a support comprising one or

Art Unit: 1754

more oxides of the metals Ti, V, Mn, Cr, Fe, Co, Ni, Cu, La, Nb, Mo, Pb, the rare earth metals having the atomic numbers from 58-71 and the actinides having the atomic numbers 89-92 (note claim 1).

The support can be TiO_2 , preferably in the rutile form (note column 3, lines 56-60). The platinum metal can be Pd, Pt, Ir, Ru or Rh (note column 4, lines 34-36). Buysch '768 further discloses that it is possible to fix one or more platinum metals by precipitation with a base. Suitable bases are NaOH, LiOH, KOH, etc. (Note column 5, lines 24-55). The catalyst is prepared by methods which are known to those skilled in the art. Thus, solutions of one or more of the platinum metals specified can be applied to the catalyst support (note column 5, lines 16-23), drying (note column 6, lines 22-28), calcining (note column 6, lines 29-45). The calcining step fairly suggests that the platinum metal is present in the catalyst in an oxide form. The calcination is carried out in air, in vacuo or in a stream of gas at from 100-800°C and the calcination time is generally few hours, for example 0.5 to 50 hours, preferably from 1 to 30 hours (note column 6, lines 29-45). The overlapping ranges of the time and the temperature would give the titanium dioxide carrier the same OH concentration as required in the instant claims.

The difference is Buysch '768 does not specifically disclose an example with rutile titanium oxide as the support and ruthenium oxide as the catalyst material, i.e. the number of embodiments disclosed in Buysch '768 is too large for anticipation.

It would have been obvious to one skilled in the art to select any combination among the specifically disclosed compounds, *Merck & Co. Inc. v. Biocraft Laboratory Inc.* 10 USPQ 1846.

Art Unit: 1754

Optionally, Bankmann or Umemura can be applied as stated above.

Applicant's arguments filed July 17, 2002 have been fully considered but they are not persuasive.

Applicants argue that the combination of the claimed rutile titanium oxide and the claimed concentration of OH groups in the titanium oxide carrier has a surprising result on the dispersity of ruthenium oxide on the surface of the titanium oxide and on the activity of the catalyst.

Applicants' argument was not persuasive because there is not sufficient evidence on record to show that the claimed concentration of OH groups on the titanium oxide carrier has an expected result on the dispersity of ruthenium oxide. In the Declaration, filed August 13, 2001, the claimed rutile TiO_2 carrier was compared to only anatase TiO_2 carrier or a carrier with low rutile %, there is no mention of any OH groups in any of the carriers.

Applicants argue that the graph, which is submitted with Applicants' response, illustrates the dependency of activity of the catalyst on amount of OH group in the titanium oxide carrier.

This argument is not persuasive for the following reasons: the catalysts in the Examples 14, 15, 17 and 5 not only have different amount of OH groups but also the rutile % and possible was formed by different methods, thus, the change in activity may not be caused by just the OH group in the titanium carrier as alleged by Applicants; moreover, the claims are drawn to a catalyst, not to a process of using a catalyst, thus, any evidence of unexpected results to the process of using the catalyst does not make the catalyst unobvious.

Art Unit: 1754

Applicants argue that Gratzel fails to recognize the problem of coagulated ruthenium oxide particles and fails to teach or suggest Applicant's claimed solution.

As stated in the above rejection, Grätzel '231 teaches that pure anatase and pure rutile have yielded good results when used in conjunction with the mixed ruthenium as a catalyst (note column 3, lines 28-30). As stated in the above rejection, the claimed amount of OH groups is only for the carrier intermediate product, not for the catalyst final product, and there is no showing to prove that after the step of forming the carrier into the catalyst, the final amount of OH groups in the claimed catalyst is different than that of the catalyst of Gratzel '231.

The rejection over Buysch is maintained for the same reasons as stated above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR

Art Unit: 1754

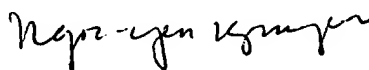
1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Ngoc-Yen Nguyen whose telephone number is (703) 308-2536. The examiner is currently on a part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for this Group is (703) 872-9311 (for OFFICIAL After Final amendment only) or (703) 872-9310 (for all other OFFICIAL faxes). UNOFFICIAL fax can be sent to (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

N. M. Nguyen
October 21, 2002


N. M. Nguyen
Primary Examiner
Art Unit 1754